CLAIMS

1. A method of measuring the RF output power (Ps) of a microwave tube amplifier (10, 30, 50), the tube having an electron gun delivering an electron beam (32), an RF circuit for interaction between an RF signal and the electron beam, the RF circuit having an amplified RF signal output, a collector having at least two electrodes (E1, E2, E3, E4) for collecting the electron beam, these electrodes being respectively separated from the gun by increasing distances, the first electrode (E1) being closest to the gun, characterized in that the RF output power as amplified RF signal output is determined from the measurement of the current (Ic1) coming from the first electrode, a calculation of the RF output power (Ps) being carried out through a predetermined relationship between said current and the output power of the amplifier.

2. The method of measuring the RF power as claimed in claim 1, characterized in that the microwave tube is a TWT.

3. The method of measuring the RF power as claimed in claim 2, characterized in that the collector of the TWT comprises two electrodes and in that the relationship between the RF output power Ps and the current Ic1 of the first electrode can be likened approximately to a straight line such that Ps = kxIc1, k being a constant.

4. The method of measuring the RF power as claimed in claim 2, characterized in that the collector of the TWT (50) comprises more than two stages and in that the relationship for the RF output power (Ps) of the TWT as a function of the collector current (Ic1) of the first electrode (E1) can be likened to a monotonically increasing polynominal.

5. The method of measuring the RF power as claimed in one of claims 2 to 4, characterized in that the relationship between the RF output power (Ps) and the current (Ic1) of the first electrode (E1) comprises a formula for interpolating the transmission frequency of the TWT.

6. The method of measuring the RF power as claimed in claim 2, characterized in that the collector of the TWT (50) comprises more than two stages and in that the relationship for the RF output power (Ps) as a function of the collector current (Ic1) of the first electrode can be likened to a straight line, although with more approximations than in the case of a two-stage TWT.

7. A microwave tube amplifier (10, 30, 50), the tube having an electron gun delivering an electron beam (32), an RF circuit (36) for interaction between an RF signal and the electron beam, the RF circuit having an amplified RF signal output, a collector having at least two electrodes (E1, E2, E3, E4) for collecting the electron beam, these electrodes being respectively separated from the gun by increasing distances, the first electrode (E1) being closest to the gun, characterized in that it includes first means (74) for measuring the current (Ic1) coming from the first electrode and second means (76) for determining the RF output power from the measurement of this current (Ic1).

8. The microwave tube amplifier as claimed in claim 7, characterized in that the first means (74) comprise an AC transformer (TX2) for delivering the first electrode with current Ica at a measurement voltage (Vc1) proportional to said current.

9. The microwave tube amplifier as claimed in claim 8, characterized in that a high voltage supply (72) for the amplifier comprising a TWT delivers, through a transformer (TX1), an AC alternating voltage U1 to a high-voltage rectifier bridge (P1) comprising rectifying diodes (D1, D2, D3, D4), that delivers the DC high voltage Vc1 and the current Ic1 of the first electrode (E1) of the TWT, the current transformer (TX2) of the measurement circuit (74) comprising a primary (120) in series with a wire (122) for supplying the high-voltage rectifier bridge (P1) with AC current and a secondary (124) that generates an AC voltage Uc1 proportional to the AC current Ica in the wire (122) representative of the supply current (Ic1) of the first electrode (E1), the AC voltage Uc1, after rectification by a diode (D6, D7, D8, D9) bridge (P2), being amplified by a conventional operational amplifier

(A1) delivering at its output (Sa) a voltage Us1 proportional to the current Ic1 of the first electrode (E1).

10. The microwave tube amplifier as claimed in one of claims 7 to 9, characterized in that the second means include a processing circuit (76) of known type, which establishes the relationship between the output voltage Us1 of the detector (74) representative of the current Ic1 and the output power Ps of the amplifier (70).

11. The microwave tube amplifier as claimed in claim 10, characterized in that the processing circuit (76) may be a computer using, for example, a microprocessor or any other calculating device.